

Name:

Name: Answers / Solutions

1. Write an equation of the line with slope  $m = \frac{-1}{2}$  and y-intercept  $b = 10$

$$y = -\frac{1}{2}x + 10 \checkmark$$

2. Write an equation of the line with point  $(4, -6)$  and y-intercept  $b = 10$

$$\begin{aligned} y &= mx + b \\ -6 &= m(4) + 10 \\ -6 &= 4m + 10 \\ -10 & \quad -10 \\ -16 &= 4m \\ -4 &= m \\ y &= -4x + 10 \quad \checkmark \end{aligned}$$

3. Write an equation of the line with point  $(-10, 6)$  and slope  $m = \frac{2}{5}$

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - 6 &= \frac{2}{5}(x - 10) \\ y - 6 &= \frac{2}{5}(x + 10) \checkmark \\ y - 6 &= \frac{2}{5}x + 4 \end{aligned}$$

$$\begin{aligned} y - 6 &= \frac{2}{5}x + 4 \\ y &= \frac{2}{5}x + 10 \checkmark \end{aligned}$$

4. Given a line containing the points  $(0, -5)$  and  $(3, 7)$ . Find an equation of the line in point-slope form. Convert your equation to slope-intercept form.

$$m = \frac{7 - -5}{3 - 0} = \frac{7 + 5}{3} = \frac{12}{3} = 4 \rightarrow y = 4x - 5 \checkmark$$

using (3,7)  $y-7 = 4(x-3)$  ✓

$$y - 7 = 4x - 12$$

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5. Given a line containing the points  $(-3, 3)$  and  $(9, 7)$ . Find an equation of the line in slope-intercept form. Convert your equation to general form (standard form).

$$m = \frac{7-3}{9-3} = \frac{4}{6} = \frac{2}{3}$$

$$y = mx + b$$

$$\hat{y} = \frac{1}{2}x + b$$

using (9.7)  $\gamma = \frac{3}{3}(9) + b$

standard form).

$7 = 3 + b$   
 $-3 = -3$   
 $4 = b$   
 $y = \frac{1}{3}x + 4$   
 $3(y = \frac{1}{3}x + 4)$

$3y = x + 12$   
 $-x + 3y = 12$   
or  
 $x - 3y = -12$

6. Given a line containing the points  $(-4, -11)$  and  $(2, 4)$ . Find an equation of the line in point-slope form. Convert your equation to general or standard form (general form).

$$m = \frac{4 - (-11)}{2 - (-4)} = \frac{4 + 11}{2 + 4} = \frac{15}{6} = \frac{5}{2}$$

Using  $(2, 4)$   $y - 4 = \frac{5}{2}(x - 2)$

$$y - 4 = \frac{5}{2}x - 5$$

$$y = \frac{5}{2}x - 1$$

$$2(y = \frac{5}{2}x - 1)$$

$$2y = 5x - 2$$

$$-5x + 2y = -2 \checkmark$$

$$5x - 2y = 2 \checkmark$$

7. Given a line containing the points  $(-5, 8)$  and  $(12, 8)$ . Find an equation of the line.

Both y-coordinates are 8

$$m = \frac{8 - 8}{12 - (-5)} = \frac{0}{17} = 0$$

horizontal line

$$y = 0x + 8$$

$$y = 8 \checkmark$$

8. Given a line containing the points  $(-3, 11)$  and  $(-3, 2)$ . Find an equation of the line.

Both x-coordinates are -3

$$m = \frac{2 - 11}{-3 - (-3)} = \frac{-9}{-3 + 3} = \frac{-9}{0} = \text{undefined}$$

The line is vertical

$$x = -3 \checkmark$$

9. Convert the equation  $3x - 2y = 8$  to slope-intercept form.

$$3x - 2y = 8$$

$$-3x \quad -3x$$

$$-2y = -3x + 8$$

$$\frac{-2y}{-2} = \frac{-3x + 8}{-2}$$

$$y = \frac{3}{2}x - 4 \checkmark$$

10. The two given equations represent lines. Are the lines parallel or Perpendicular or

neither? Explain briefly why.  $y = 4x - 7$  &  $y = \frac{1}{4}x - 1$

The slopes are 4 and  $\frac{1}{4}$  which are not the same but also not opposite reciprocals.  
The lines are neither parallel nor perpendicular.

11. The two given equations represent lines. Are the lines parallel or Perpendicular or

neither? Explain briefly why.  $y = \frac{3}{2}x + 1$  &  $y = \frac{3}{2}x - 4$

The slopes are  $\frac{3}{2}$  and  $\frac{3}{2}$ , therefore, the same.  
The lines are parallel  $\checkmark$



12. The two given equations represent lines. Are the lines parallel or Perpendicular or

neither? Explain briefly why.  $y = \frac{5}{2}x - 3$   $y = -\frac{2}{5}x - 3$

The slopes are opposite reciprocals  $\frac{5}{2}$  and  $-\frac{2}{5}$ , therefore, the lines are perpendicular  $\perp$  ✓

13. The two given equations represent lines. Are the lines parallel or Perpendicular or neither? Explain briefly why.  $4x + y = -3$  &  $x - 4y = -8 + 2$

$$\begin{array}{r} 4x + y = -3 \\ -4x \quad -4x \\ \hline y = -4x + 3 \\ y = -4x + 3 \end{array}$$

$$\begin{array}{r} x - 4y = -6 \\ -x \quad -x \\ \hline -4y = -x - 6 \\ -4y = \frac{-x}{-4} - \frac{6}{-4} \\ \hline y = \frac{1}{4}x + \frac{3}{2} \end{array}$$

The slopes are  $-4$  and  $\frac{1}{4}$  therefore the lines are  $\perp$  ✓

14. The two given equations represent lines. Are the lines parallel or Perpendicular or neither? Explain briefly why.  $x - 2y = 4$  &  $-3x + 6y = -18$

$$\begin{array}{r} x - 2y = 4 \\ -x \quad -x \\ \hline -2y = -x + 4 \\ -2y = \frac{-x}{-2} + \frac{4}{-2} \\ \hline y = \frac{1}{2}x - 2 \end{array}$$

$$\begin{array}{r} -3x + 6y = -18 \\ +3x \quad +3x \\ \hline 6y = 3x - 18 \\ \frac{6y}{6} = \frac{3x}{6} - \frac{18}{6} \\ \hline y = \frac{1}{2}x - 3 \end{array}$$

The slopes are both  $\frac{1}{2}$  so the lines are parallel ✓

15. Line A has equation  $y = 3x + 1$ . Line B contains the point  $(-1, -8)$  and is parallel to line A. Determine an equation for line B.

Line B has slope  $m = 3$   
 using  $(-1, -8)$   $y = mx + b$   
 $-8 = 3(-1) + b$   
 $-8 = -3 + b$   
 $+3 \quad +3$   
 $-5 = b$   
 $y = 3x - 5$  ✓

16. Line A has equation  $y = \frac{2}{5}x - 6$ . Line B contains the point  $(4, -9)$  and is perpendicular to line A. Determine an equation for line B.

Line B has slope  $m = -\frac{5}{2}$   
 $y = -\frac{5}{2}x + b$   
 using  $(4, -9)$   $-9 = -\frac{5}{2}(4) + b$   
 $-9 = -5(2) + b$   
 $-9 = -10 + b$   
 $+10 \quad +10$   
 $1 = b$   
 $y = -\frac{5}{2}x + 1$  ✓

I changed this from parallel to  $\perp$